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THE SOVIET ARMY

OPERATIONS AND TACTICS

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PREFACE

This field manual is part of FM series 100-2, *The Soviet Army.* The other volumes are FM 100-2-2, *The Soviet Army: Specialized Warfare and Rear Area Support,* and FM 100-2-3, *The Soviet Army: Troops, Organization and Equipment.* These manuals cannot stand alone but should be used interchangeably.

These field manuals serve as the definitive source of unclassified information on Soviet ground forces and their interaction with other services in combined arms warfare. These manuals represent the most current unclassified information and they will be updated periodically. More information would become available in the event of war or national emergency.

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CHAPTER 16

NUCLEAR, BIOLOGICAL, AND CHEMICAL WARFARE

The Soviets anticipate the use of nuclear, biological, and chemical (NBC) weapons, particularly nuclear and chemical. The Soviets have developed and fielded a wide range of NBC detection and warning devices, individual and collective protective equipment, and decontamination equipment that facilitates the continuation of combat operations despite the presence of contaminants. *The Soviet ground forces' capability to protect themselves against NBC weapons and to operate in contaminated environments is unmatched by any other military force in the world.* Another factor illustrating the Soviets' overall preparedness for combat operations in an NBC environment is the extensive psychological conditioning that is combined with NBC training. The Soviet soldier is conditioned to regard the employment of NBC weapons as a real possibility in modern warfare. He is further conditioned to regard an NBC environment not as a disastrous situation, but one in which well-trained and skillful troops can survive and which they can use to their advantage.

The Soviets readily admit that casualties would be considerable in any future war involving the use of NBC weapons. However, they insist that the timely use of protective equipment, correct employment of reconnaissance assets, and expeditious decontamination procedures can significantly reduce a combat unit's vulnerability.

During the last decade, the Soviets have steadily improved their capability for waging theater nuclear and chemical warfare, while significantly improving their conventional fire support capabilities. This force modernization has introduced a degree of flexibility previously unavailable to Soviet combined arms commanders and created multiple options for the employment of nuclear and chemical weapons. Consequently, the Soviets have examined the possibility of waging a theater conflict at different levels, with or without nuclear weapons. They have developed what would seem to be a more balanced view toward the complementary employment of nuclear and nonnuclear fire support.

Confident that they can fight decisively with or without nuclear weapons, the Soviets now consider that a major conflict may be nonnuclear for at least an initial period and may remain nonnuclear for the duration of the conflict in certain "peripheral" theaters. Despite the potential for a sustained period of conventional or nonnuclear combat, a theater conflict will be conducted under a "nuclear-scared" posture.

The Soviets classify both nuclear and chemical weapons as "weapons of mass destruction" relative to troop protective measures, but consider chemical munitions to be "conventional" weapons when discussing employment doctrine.

NUCLEAR WEAPONS

The Soviets classify nuclear weapons according to yield or explosive power and type of burst. Nuclear weapons are considered very high in explosive power if their yield is over 500 kilotons, high if between 100 and 500, medium if between 15 and 100, and low if up to 15 kilotons. Types of burst that may be employed are air, ground (surface), underground, and underwater.

Soviet training materials present detailed descriptions of the destruction factors associated with nuclear explosions—the shock wave, thermal and light radiation, initial (penetrating) radiation, and residual radioactive contamination of the ground. The Soviets attribute the bulk of a nuclear weapon's destructiveness to its shock wave, although the actual distribution of energy depends largely on the type of burst employed. Following an atmospheric explosion, for example, 50 percent of the resultant energy is said to be released through the shock wave. Thermal and light radiation accounts for 35 percent of the energy for such a blast; initial radiation, 5 percent; and fallout, 10 percent for those weapons employed in the ground burst mode.

In measuring both initial radiation and fallout, the Soviets use *roentgen* (r) as the standard unit of measurement of radiation absorbed dose. The Soviets prefer to measure radiation dosage in roentgens rather than rads and do not specify time periods for total exposure doses when discussing the various degrees of radiation sickness. One roentgen (r) equals 0.88 rads.

They state that a single dose of up to 50 r in the course of 4 days or a continuous dose of up to 100 r over 10 days is not considered dangerous. Doses greater than 100 r are said to cause radiation sickness. First-degree radiation sickness occurs when a total dose of 100 to 200 r is absorbed. The latency period lasts from 2 to 3 weeks, and symptoms include lethargy, nausea, and intermittent fever. First-degree radiation sickness is curable. Second-degree radiation sickness is caused by a total exposure dose of 200 to 300 r. The latency periods lasts about 1 week, after which radiation induced symptoms appear. The symptoms are similar to those experienced with

first-degree radiation sickness but are more severe. Recovery takes about 2 months with good medical care. Third-degree radiation sickness is caused by a total exposure dose of 300 to 500 r. The latency period is only a few hours, and the symptoms are still more severe. With active medical treatment, recovery takes several months. A dose greater than 500 r is usually fatal. Radioactive contamination of an area, or fallout, is measured in roentgens per hour. According to the Soviets, an area is contaminated if 0.5 roentgens per hour or more is measured.

Besides the shock wave, thermal and light radiation, initial radiation, and fallout produced by nuclear weapons, the Soviets mention secondary effects such as fires and electromagnetic interference. Electromagnetic interference, or electromagnetic pulse (EMP), originates with the release of nuclear radiation. It is a pulse of short duration that covers most of the usable frequency band to a range greater than the other effects of the detonation. EMP can burn out unprotected electronic equipment such as data processing and intelligence equipment, weapons systems, and radars.

NUCLEAR OPERATIONS

Planning

Although the opening stages of an offensive are likely to be conventional, planning focuses on the necessity to counter enemy employment of nuclear weapons, to maintain the initiative and momentum of the offensive, and to maintain fire superiority over the enemy (preempt his strike). The fire plans for divisions and higher levels include contingency plans for nuclear strikes. At all stages nuclear delivery means will be surveyed in and target-ready to make a strike. The decision to initiate tactical nuclear warfare would be made at the highest level of government. The fire plan for the initial massive nuclear strike, as it would include strikes by the Strategic Rocket Forces (SRF), is probably developed at theater level and approved by the Supreme High Command. Employment authority for subsequent nuclear strikes probably is delegated to *front* and may be as low as army command level. The division chief of rocket troops and artillery (CRTA) submits recommendations for the subsequent employment of the division's nuclear and chemical weapons to the army commander for approval and integration into army and *front* fire support plans.

In deliberately planned operations, nuclear fires are planned in detail. In more mobile situations, as in meeting engagements, exploitation, and pursuit, some nuclear weapon systems are kept in high readiness to fire on targets of opportunity.

Soviet target analysts favor airbursts and use larger yields than their US counterparts. Strikes near the FEBA are to be followed up by maneuver forces as closely as safety and circumstances permit. Deep strikes may be exploited with the use of airborne troops.

Nuclear allocations vary with the strength of the enemy defense and the scheme of maneuver. A main attack probably receives the highest percentage of weapons; however, weapons also might be reserved for other large, important targets.

Targeting

Soviet nuclear delivery systems that threaten the European theater include intermediate-range ballistic missiles (IRBM) and medium-range ballistic missiles (MRBM) stationed in the Soviet Union. They also include aircraft from both strategic and *frontal* aviation, rockets and surface-to-surface missiles with ranges from 70 to 900 kilometers, and 203-mm howitzers and 240-mm mortars.

The following targets are considered suitable for employment of tactical nuclear strikes:

- Enemy nuclear-delivery means—air, artillery, missiles, and rockets. (These receive the highest priority.)
- Headquarters of division and higher levels.
- Prepared defensive positions.
- Reserves and troop concentrations.
- Supply installations, especially nuclear ammunition storage points.
- Communication centers.

Soviet targeting analysts work on the assumption of high reliability of nuclear delivery means. They usually rely on one device per target. If a target is considered to require more than one nuclear device, coverage will be overlapping.

The suitability of targets is determined by their priority category, missions, the current tactical situation, and the nuclear weapons available for use.

Offensive Employment

Once the decision to release nuclear weapons is made, their use is governed by two principles: mass and surprise. The initial nuclear strike will be accomplished suddenly, throughout the depth of the enemy's combat deployment, and in coordination with nonnuclear fires. Initial nuclear strike objectives are—

- To destroy the enemy's main combat formations and his command and control system.

- To destroy the enemy's nuclear weapons.
- To isolate the battlefield.
- To breach the enemy's main line of defense and define the main axes of attack.

Nuclear fires are employed to support the main attack while other fire support means support secondary or supporting attacks. The enemy's forward defenses are targeted and destroyed rather than avoided and bypassed. Nuclear strikes in effect are the main attack. These strikes then are exploited by a high-speed air and ground offensive.

Subsequent nuclear strikes are integrated with the maneuver and fire support plans and employed to re-initiate an offensive that has been slowed or stopped by organized enemy resistance. Nuclear strikes also may be used to eliminate the threat of a counterattack and to clear resistance from the opposite bank in a river crossing. In pursuit, nuclear strikes are planned on "choke points" when retreating enemy forces present lucrative targets.

Defensive Employment

If an enemy offensive can be severely degraded by the impact of nuclear weapons, the defender may gain the opportunity to switch quickly to an offensive role. This drastic change in force correlation is sought when nuclear weapons are employed on the defense. Primary uses are—

- Destruction of enemy nuclear delivery means.
- Destruction of main attacking groups.
- Counterpreparations.
- Elimination of penetrations.
- Support of counterattacks.
- Denial of areas to the enemy by use of surface bursts.

Radiologically contaminated barriers produced by surface or subsurface bursts may be used to prohibit or slow the advancing enemy and to canalize large elements into pockets to become a nuclear target.

BIOLOGICAL WEAPONS

Since the summer of 1979, information has been obtained from a variety of sources that presents evidence of an inadvertent release of anthrax bacteria from a highly secured military installation in Sverdlovsk. The available information and US technical analysis point strongly to biological research and development activities that exceed those normally expected for biological warfare protection purposes.

If biological weapons are employed, they would probably be targeted against rear area objectives such as food supplies, water sources, troop concentrations, convoys, and urban and rural population centers rather than against front line forces. The Soviets realize that if biological agents are employed against such targets, they could seriously disrupt and degrade mobilization plans as well as the subsequent conduct of a war. Some biological agents are extremely persistent, retaining their capabilities to infect for days, weeks, or longer. The prolonged incubation period makes it difficult to track down the initial location and circumstances of contamination.

Biological weapons consist of pathogenic microbes and the toxins caused by micro-organisms, both of which are intended to incapacitate or kill people or animals and destroy plants, food supplies, or material. Almost a thousand different types of pathogenic micro-organisms are known to exist; however, not all of them are adaptable for use in warfare as biological weapons. Micro-organisms are classified as bacteria, viruses, rickettsia, or fungi. Bacteria, which are resistant to both low temperatures and freezing, cause diseases such as bubonic plague, cholera, and anthrax. Viruses are responsible for smallpox, variants of encephalitis, and yellow fever. Rickettsia, bacteria-like micro-organisms which are found living as parasites in arthropods, can cause certain human diseases such as rocky mountain spotted fever. Fungi are similar to bacteria in that both exist in plants; however, fungi have a more highly developed structure. Toxins are a class of highly active poisons produced as a naturally occurring by-product of some living organisms, or through a chemical production method. A few well-known diseases that are produced by toxins include botulism, tetanus, and diphtheria. Toxins can retain their potency for many weeks and, in some cases, for months. Available delivery means mentioned by the Soviets include rockets, artillery shells, mines, air-dropped packets, aircraft sprayers, saboteurs, and infected insects and rodents.

There is a degree of danger inherent in the use of some pathogenic microbes because of the difficulty or near impossibility involved in controlling an epidemic caused by them. Some pathogenic microbes and toxins derived from microbes are not contagious, while other microbes cannot be transmitted without a suitable vector.

CHEMICAL WEAPONS

The armed forces of the Soviet Union are better equipped, structured, and trained than any other military force in the world to conduct offensive and defensive chemical warfare. Although the Soviets are aware

of their overwhelming advantage, they continue to steadily improve their chemical warfare capabilities. Much of their training revolves around the use of lethal agents. Reports from Afghanistan and Southeast Asia show the Soviet's willingness to use chemical agents when it is to their advantage.

The basic Soviet principle of chemical warfare is to achieve surprise. They would use massive quantities of chemical agents against unprotected troops or equipment. Chemical agents also may be used to restrict the use of terrain.

Initially, the use of chemical weapons may be subject to the same level of decision as nuclear weapons, but they are likely to be used more freely once the initial authority for employment has been given. In a nuclear war, chemical weapons are used to complement nuclear weapons. However, they may be used in a nonnuclear environment against an enemy whose chemical defenses are weak or where their use would be particularly advantageous.

Airfields, nuclear storage sites, and nuclear delivery systems are targets for chemical attacks since such targets can be neutralized without the necessity of pinpoint strikes. Also, contamination of key points along rear area lines of communication can seriously disrupt rear area resupply and reinforcement, while simultaneously keeping those points intact for subsequent use by attacking Soviet forces.

In the offense, other likely chemical targets are—

- Troops occupying defensive positions across the front of a Soviet attack. The troops may be neutralized by nonpersistent agents delivered by multiple rocket launchers.
- Nuclear delivery systems, troop concentration areas, headquarters, and artillery positions. All types of chemical agents delivered by field guns, multiple rocket launchers, missiles, and aircraft are the most likely.
- Bypassed pockets of resistance which pose a threat to the flanks or rear of attacking forces. Defending troops can be attacked directly or their movement restricted by contamination.

In defense, persistent chemical agents are employed to deny the enemy use of certain terrain and to canalize attacking forces. Chemical agents are employed against an attacking force to impede effective command and control and to destroy the momentum of the attack by causing the attacking troops to adopt protective measures.

The Soviets have a variety of systems capable of chemical delivery. They include aircraft, multiple rocket launchers, artillery, mines, rockets, and missiles.

The Soviets classify chemical agents according to the effect they have on the organism. They identify six major types: nerve, blood, blister, choking, psychochemical, and irritant. Nerve agents are fast-acting chemical agents. Practically odorless and colorless, they attack the body's nervous system causing convulsions and eventually death. A fatal dose consists of only 2 to 10 milligrams. Nerve agents are further classified as either G or V agents. G agents were developed in Germany before and during World War II and include the agents Tabun, Sarin, and Soman. The V agents are quicker acting and more persistent than the G agents. Blood agents cause death by blocking the oxygen transferral mechanisms in the body. A common blood agent is hydrogen cyanide.

Blister agents, such as mustard (H) or lewisite (L) and combinations of the two compounds, can disable or kill after contact with the skin, or after being inhaled into the lungs or ingested. Contact with the skin can cause painful blisters or blindness after eye contact. These agents are especially lethal if inhaled. Incapacitants disrupt a victim's mental and physical capabilities. Consciousness may not be lost, however, and the effects usually wear off without leaving permanent physical injuries. Irritants, also known as riot-control agents, cause a strong burning sensation in the eyes, mouth, skin, and respiratory tract. The effects of these agents, the best known being tear gas, are also temporary. Victims recover completely without having any serious aftereffects.

Chemical agents are categorized as persistent or nonpersistent. Persistent agents, such as V-agents, some G-agents, and the blister agent mustard, can retain their disabling or lethal characteristics depending on environmental conditions for days, weeks, and in some cases, years. Nonpersistent agents generally last a shorter period of time, depending on weather conditions. Soviet military writings indicate that nonpersistent agents would be used across the front of a Soviet attack before a combat engagement. Persistent agents would be used deep within the enemy's rear and along troop flanks to protect advancing units.

The Soviets possess antidotes for protection from agents of potential adversaries as well as their own. They have developed and fielded an antidote for soman, which is an agent they possess but is not in the US inventory.

Chemical agents believed to be in the Soviet inventory include the agents described in the chart at right. Stockpiles of chemical agents greatly exceed those available to the West and are sufficient to sustain large scale use.

Chemical Agents Reportedly Stockiled by the Soviet Union

TYPE OF AGENT	SYMBOL/NAME	SYMPTOMS IN MAN	EFFECTS ON MAN	RATE OF ACTION
NERVE	G Series GB/Sarin GD/Soman (VR 55)	Difficult breathing, sweating, drooling, nausea, vomiting convulsions, and dim vision.	At low concentrations, incapicitates; kills if inhaled or absorbed through the skin.	Very rapid by inhalation; slower through skin.
	V Agent		Incapacitates; kills if contaminated skin is not decontaminated rapidly.	Delayed through skin; more rapid through eyes.
BLOOD	AC/Hydrogen cyanide	Rapid breathing, convulsions, coma, and death.	Incapacitates; kills if high concentration is inhaled.	Rapid.
BLISTER	HD/Mustard HN/Nitrogen Mustard L/Lewisite HL/Mustard and Lewisite CX/Phosgene Oxime	Mustard; nitrogen mustard-no early symptoms. Lewisite and mustard-searing of eyes and stinging of skin. Phosgene oxime-powerful irritation of eyes, nose and skin.	Blisters skin and respiratory tract; can cause temporary blindness. Some agents sting and form wheals on skin.	Blister delayed hours to days; eye effects more rapid. Mustard lewisite and phosgene oxime very rapid.
INCAPACITANT	None known, but a sleep inducer has been reported in Afghanistan.	Slowing of mental and physical activity; disorientation and sleep.	Temporarily incapacitates.	Unknown.
IRRITANT	DA/Diphenylchloroarsine DM/Adamsite CN/Choroacetophenone CS/O-Chlorobenzalmalononitrile PS/Chloropicrin	Causes tears, irritates skin and respiratory tract.	Incapacitates, nonlethal.	Very rapid.

SOVIET PROTECTION AND WARNING EQUIPMENT

Most Soviet NBC equipment is dependable and apparently in good supply. Some of it, as in the case of the electrically fired warning flag dispenser, is rather ingenious. However, other pieces of protective NBC equipment have drawbacks. One deficiency is the low level of human engineering that is applied to their general design. An additional shortcoming is the potential effect of weather on chemical and radiation reconnaissance instruments, which are calibrated for optimal use within rather narrow ranges of temperature (-40 degrees to +40 degrees C) and humidity (50 to 80 percent). In winter, the instruments are warmed up chemically or electrically before use. The present inventory of NBC equipment includes, but is not limited to, detection and warning devices, individual and collective protective equipment, and decontamination equipment. For information concerning individual items of equipment, see FM 100-2-3.

CHEMICAL DEFENSE TROOPS

There are approximately 80,000 to 100,000 fulltime NBC defense personnel in the Soviet ground forces. Although they are designated "chemical defense troops," their responsibilities also include protection against the effects of nuclear and biological weapons. Like engineer and signal forces, chemical defense troops are considered a vital element of combat support. Although all troop branches of the ground forces can be assigned to perform certain NBC protection-related activities, chemical defense troops are tasked with primary responsibility for insuring that combat units function as capably as possible in an NBC environment.

Chemical defense troops have two primary missions: NBC reconnaissance and NBC decontamination. Their basic missions include—

- Reconnoitering known or likely areas of NBC contamination.
- Warning troops of the presence of NBC contamination.
- Monitoring changes in the degree of contamination of troops positions.
- Monitoring the NBC contamination of personnel, weapons, and equipment.
- Performing decontamination of personnel, weapons, clothing, equipment, vehicles, troop positions, and sections of roads.

The basic chemical defense unit is the chemical defense company which is organic to tank and motorized rifle regiments. The company has an authorized strength of 35 to 50 personnel. At division level, there is a chemical defense battalion with an authorized personnel strength of approximately 200 men. A chemical defense battalion is also organic to each combined arms and tank army. These battalions are larger than the ones organic to divisions and at full strength consist of several hundred personnel. The largest chemical defense troop unit is the chemical defense brigade subordinate to military districts and probably subordinate to Soviet groups of forces stationed in non-Soviet Warsaw Pact nations.

The reconnaissance and decontamination elements of chemical defense units are rarely employed as whole units. Commanders from military districts through regiments usually divide their chemical defense assets and assign them to their various maneuver units in a direct support role. No chemical defense units are subordinate to manuever battalions or companies. However, each tank and motorized rifle company has an NBC noncommissioned officer heading a small team of extra duty NBC specialists. Company- and battalion-level NBC specialists are capable of checking unit NBC equipment and conducting NBC training. They also help decontaminate personnel and equipment and perform limited NBC reconnaissance when regimental NBC support is unavailable.

NBC TRAINING

Training of Soviet ground forces in NBC defense is comprehensive and realistic. It covers recognition and detection of NBC agents, operation of NBC measuring and monitoring instruments, procedures for warning troops of NBC attack, self-protection, self-administration of antidotes, and decontamination. Realism is emphasized to the extent that live, albeit diluted, agents are occasionally used during training exercises.

NBC protective training actually starts long before a conscript enters military service. Soviet citizens are required to attend civil defense instruction as early as the second grade. This instruction takes place during the years of formal education and continues at factories and collective farms. Also, youth organizations such as the Pioneers, *Komsomol,* and DOSAAF teach NBC defense subjects. So when the typical Soviet male is drafted, he already knows how to use a protective mask. He is familiar with the effects of NBC weapons and knows correct procedures for protecting himself.

Ground forces' training programs integrate NBC defense with other training. NBC training is conducted along with firing exercises, tactical problems, field exercises, and specialist—such as engineer—training. While qualifying at a rifle range, troops frequently are required to wear their protective suits and masks. During tactical drills, such as penetration of an enemy defensive position, NBC attacks are simulated. Personnel receive orders to don protective gear, to button up inside combat vehicles, and take other appropriate actions. Following completion of their mission, exercise personnel decontaminate weapons, equipment, and themselves. During engineer training, ground forces combat troops learn to perform engineer duties required in a NBC environment. Such duties include upgrading personnel shelters to provide for NBC defense and clearing rubble and obstructions following a nuclear blast.

Premilitary Training

The 1967 Soviet Law on Universal Military Service instituted a program of premilitary training for Soviet youth, both boys and girls. This training takes place in general education schools, technical-vocational schools, factories, and collective farms. Premilitary training consists of 140 hours of instruction. Civil

defense, and particularly NBC defense, subjects account for 35 of the 140 hours of instruction. Although premilitary training in schools normally begins with the ninth grade, Soviet youth receive limited NBC training, primarily consisting of protective mask drills, in the second and fifth grades as well.

Premilitary training in NBC defense consists of both theoretical and practical instruction, with the practical accounting for more than half of the training received. Theoretical training includes classes on the types of nuclear, chemical, and biological weapons found in foreign armies; their physical properties and means of employment; and the effects of weather and terrain on their employment. During practical instruction conducted in classrooms and on training fields, youths learn how to defend themselves against NBC weapons, construct shelters and slit trenches, administer first aid for NBC-related wounds, use NBC protective masks, conduct reconnaissance and rescue work in contaminated areas, and decontaminate personnel and equipment.

Besides premilitary instruction at school and on the job, Soviet youth must attend a summer camp for about 5 days. These camps emphasize field training in the same military subjects taught previously in schools, factories, and collective farms. Instruction in NBC defense equipment and procedures is an important part of the program. The camps normally are set up at training areas of nearby military units. Trainees compete with one another in a program that is closely integrated with a physical fitness program. Those who excel are awarded badges.

Besides the NBC portion of the required 140 hours of premilitary instruction, Soviet youths receive NBC defense training through voluntary participation in the activities of DOSAAF, *Komsomol,* and Pioneers. The annual military games (known as *Zarnitsa* and *Orlenok)* conducted by the Pioneers and *Komsomol,* respectively, also provide NBC defense training for Soviet youths before induction. (More information on DOSAAF, *Komsomol,* and Pioneers can be found in *FM 100-2-2.*)

Unit Training

Following basic training and on assignment to a unit, a Soviet soldier's training builds from simple to complex and from theory to practice. This is particularly true of NBC defense training, which begins with theoretical classroom instruction on NBC weapons and how to defend against them. It continues with training drills conducted both in classrooms and at specially equipped field training sites where troops rehearse individual training topics. This three-tiered training program culminates with field exercises aimed at testing ground force capability to perform in an NBC environment.

The chemical service chiefs of regiments and divisions plan and supervise NBC defense training. At battalion, a chemical instructor, probably a warrant officer or NCO, performs this function.

Theory. Theoretical instruction normally is given by platoon commanders and begins in classrooms with lectures on the physical properties and effects of chemical and biological agents and nuclear explosions. Trainees also learn how weather and terrain influence the use of NBC weapons and the persistent contamination of various objects by NBC agents. Instructors familiarize troops with the types of NBC weapons found in military organizations of the West and their methods of employment. Training aids include posters depicting the various stages of a nuclear blast, mockups of munitions used to disseminate chemical and biological agents, and film strips depicting the effects of NBC weapons.

During classroom sessions, information on the destructive characteristics of NBC weapons is balanced with instruction on protective aspects of the terrain, man-made shelters, and defensive NBC equipment. While Soviet soldiers are taught to respect the destructive power of NBC weapons, they are also indoctrinated against viewing combat in an NBC environment as hopeless. For example, while studying the characteristics of the shockwave and fallout of a nuclear burst, trainees also learn that the nature and number of troop casualties depend on their position and degree of protection at the moment of blast, distance from the burst, and yield of the weapon.

Training Drills. Following classroom instruction, soldiers participate in drills to practice putting on protective masks and protective suits, administering antidotes, and decontaminating themselves and their equipment. Specific drills are performed until proficiency is attained. Later, during the tactical exercise phase of the training program, all the various NBC defense measures are practiced. When participating in the drills, troops normally train by squads and the entire training effort is led by platoon commanders. The soldiers are tested on their performance within specified time limits. They also are evaluated on the length of time that they are able to wear a mask and protective suit while performing routine military tasks such as marching, loading equipment, firing weapons, and working with various types of instruments.

Field Exercises. After attaining the necessary level of competence, personnel are ready for the third stage of NBC defense training: the performance of NBC defense measures during field exercises. During exercises such as an attack against a fortified position, motorized rifle troops are made to cross simulated zones of contamination in full protective gear, to perform decontamination of weapons and equipment, and to practice the administration of chemical agent antidotes. Occasionally exercises are conducted with training type agents.

During a march, simulated NBC attacks frequently occur and subunits are forced to react accordingly. They disperse along the road at specified intervals, cross "contaminated" zones while observing correct NBC defense measures, conduct brief halts to perform limited decontamination, and then continue their advance. Troops don masks and protective suits while on the march and during the conduct of firing training.

During tactical exercises conducted under simulated NBC conditions, maximum use is made of available training aids and actual equipment to heighten realism. Mockups of destroyed combat vehicles obstruct march routes. Detonated minefields produce craters to hinder cross-country movement. Smoke-producing demolitions simulate nuclear clouds of nuclear attacks. Soldiers are notified of NBC attacks and contaminated areas as they would be during actual combat by preestablished signals over radios and by flares. During decontamination procedures, troops train with actual equipment. Combat troops also train jointly with chemical defense units during exercises that involve the decontamination of heavy equipment.

Training of Chemical Defense Troops

Soldiers assigned to chemical defense units of the ground forces also undergo a three-tiered training program in NBC defense. However, NBC defense training given to chemical defense troops is more detailed and wider in scope than that presented to regular ground force troops.

Following classroom instruction, chemical defense troops are divided into groups according to specialty and taken to training areas where they practice their particular skills. When training with a large and complex piece of equipment, such as a DDA decontamination station, experienced service personnel first demonstrate how to set it up and put it into operation. Then the trainees themselves do the work sequentially at a slow pace. After chemical defense trainees acquire competence in individual tasks, they perform the drill at a normal pace without interruption within a prescribed time limit. Next, they learn to work with their instruments in complicated conditions, such as while wearing NBC protective gear. Once proficiency is attained in this manner on a particular piece of equipment, cross-training within crews and between squads is practiced.

The third step in the training cycle is the performance of NBC specialist tasks within the framework of a tactical situation. While in the field, chemical defense exercises include—

- Reconnoitering "contaminated" areas of terrain.
- Measuring the intensity of "contamination" and posting warning signs.
- Transmitting NBC reconnaissance data by radio.
- Performing decontamination of vehicles, personnel, and equipment.

Like other ground forces elements, chemical defense personnel participate in competitions at the end of the training year.

In combat, chemical defense troop units would be divided. They would provide support directly to combat units. To train for such a role, chemical defense troops participate in the field training exercises of motorized rifle and tank units. Accordingly, NBC reconnaissance specialists constitute part of a forward detachment or advance guard of motorized rifle and tank units conducting march and offensive training. Decontamination units often set up their stations and practice decontamination of troops.

Training of Chemical Defense Officers

Some officers assigned to the chemical defense troops are graduates of officer training programs in civilian educational institutions, although most are trained at commissioning schools similar in many respects to US military academies. The Soviets presently maintain three service schools for chemical defense officers: the Saratov Higher Military Engineer School of Chemical Defense, the Tambov, and the Kostroma Higher Military Command Schools of Chemical Defense. All three provide students with a general military education as well as specialist training in NBC defense. The Saratov school involves a 5-year curriculum and trains cadets in engineering for technical positions in the chemical defense troops. Graduates are commissioned as lieutenant-engineers and are qualified as chemical engineers. The Tambov and Kostroma institutions are 4-year schools that train officers for command positions in the chemical defense troops. Graduates receive the rank of lieutenant.

After an officer has served a number of years in a chemical defense unit, he is eligible for further schooling in his speciality at the Timoshenko Military Academy for Chemical Defense located in Moscow. Applicants must have graduated from a higher military school, such as the Tambov, Saratov, and Kostroma schools; have at least 2 years of practical troop experience; and pass an entrance examination. Applicants who are not accepted for resident study may apply for a correspondence program. Most officers who attend the academy are senior captains and majors. Successful completion of the course is a prerequisite to further advancement.

PROTECTIVE MEASURES

Basic tactical measures for protection against NBC weapons include dispersion, rapid movement, deception, and camouflage. Other measures call for continuous contact with the enemy ("hugging") or withdrawal from expected nuclear target areas.

NBC Protective Equipment

Basic personal protective measures begin with NBC protective equipment. Such protective equipment issued to the ground forces, when used correctly and in combination, provides protection against harmful agents that attack through both the respiratory system and the skin. They also reduce the degree of injury caused by thermal and light radiation emitted during a nuclear explosion. More important, Soviet NBC protective equipment enables combat troops to operate on contaminated terrain, which allows the continuous conduct of combat operations. Troops don their protective masks and cover themselves with their protective capes the instant of an NBC attack. They don their protective suits, gloves, and boots to the degree required after the agents settle.

Troops normally are notified of an NBC attack or contaminated areas by chemical observers who make use of preselected signals: flares and radio transmission of codewords. The warning then is passed on by voice and vehicle horns. Troops having firsthand knowledge of an NBC attack or contaminated area take appropriate action immediately, without awaiting the signal or an order to do so. Vehicles with troops riding in open beds or on top of them stop briefly to allow the troops to don their protective masks and capes.

Depending on the location of troops, the circumstances surrounding an NBC attack, and the type of agent employed, various protective measures are adopted, either separately or in combination.

A significant characteristic of most NBC protective suits, including Soviet models, is the physical burden associated with prolonged wear, especially in warm temperatures. The suits are bulky and uncomfortable. When worn fully buttoned-up for an extended period of time in hot weather, soldiers become fatigued quickly and combat efficiency is lowered. In some cases, heat prostration may result. Accordingly, the Soviets have devised norms stipulating desired maximum lengths of time for various temperature ranges for wearing NBC protective suits.

Wearing Periods for NBC Protective Suits

TEMPERATURE (CENTIGRADE)	MAXIMUM TIME SPENT IN PROTECTIVE SUIT
30° and above	15 to 20 minutes
25° to 29°	Up to 30 minutes
20° to 24°	40 to 50 minutes
15° to 19°	1.5 to 2 hours
Below 15°	More than 3 hours

The Soviets use these norms as guidelines only, realizing that certain situations may require troops to wear protective suits beyond desired maximum times. In most chemical environments, troops leave the bottom of the protective suit unbuttoned to reduce the heat load.

Besides intensification of training, the Soviets advocate the use of collective protection systems, such as shelters and combat vehicles equipped with filter and ventilation systems. When riding in non-NBC protected combat vehicles, personnel need only don protective masks during an NBC attack or when crossing contaminated terrain. They do not need to wear protective suits, masks, gloves, or boots when riding inside NBC protected vehicles. One drawback of collective protection systems is that personnel exiting a shelter or vehicle cannot return until they completely decontaminate or remove their protective clothing to avoid contaminating the inside of the shelter or vehicle.

NBC Reconnaissance

This is performed by chemical defense personnel assigned to reconnaissance elements of chemical defense units. NBC reconnaissance involves two general types of activity—NBC observation posts and NBC reconnaissance patrolling.

Although normally staffed with chemical defense specialists, NBC observation posts can be manned by combat troops who have received special training. The functions of NBC observation posts are to detect NBC contamination, to determine radiation levels and types of toxic substances, to monitor the drift of radioactive clouds, to notify higher headquarters of NBC information, as well as meteorological data, and to give the general alarm to threatened troops. An NBC observation post normally consists of three or four observers located near the command post of a combat unit. During movement, the NBC observation post moves in its own vehicle in close proximity to the combat unit commander.

On detecting NBC contamination, the observers measure the intensity of radioactivity or determine the type of chemical or biological agent and report this information to the supported commander. The commander plots the information on his map and reports to the next higher headquarters. NBC reconnaissance posts report directly to the supported commander rather than to the commander of their chemical defense unit. To accelerate the transmission of information, a standardized radio message is used.

In the event of an enemy nuclear attack, observers switch on their detection instruments immediately after the shock wave passes. The observers estimate the type and location of the burst and the direction of movement of the contaminated cloud. They then give the general warning and notify the unit commander.

When operating in chemical reconnaissance patrols, chemical defense personnel travel in reconnaissance vehicles specially equipped with NBC detection and warning devices. The Soviets also have experimented with the use of helicopters to perform NBC reconnaissance. Helicopters equipped with chemical and radiological area survey instruments are particularly useful for performing reconnaissance of areas with extremely high contamination levels. Helicopters also aid in screening large areas of terrain when time is limited.

The reconnaissance assets of chemical defense units, such as the chemical reconnaissance platoon of a chemical defense company, can reconnoiter a large contaminated area or be divided into squads and attached to combat units to perform reconnaissance of multiple routes. Before starting a mission, a chemical reconnaissance patrol receives the following information from the chemical reconnaissance platoon leader:

- Enemy situation, route(s) or area to be reconnoitered.
- Times for beginning and completing the reconnaissance; to what point, line, or level of radiation to conduct the reconnaissance.
- Procedures for submitting reports and messages.
- Interval for switching on detection instruments.
- Signals to be used for warning troops of contamination or enemy NBC attack.
- Location of the assembly area to be occupied by the patrol following completion of the reconnaissance mission.

Before a patrol begins its mission, personnel check their individual NBC protection equipment and detection instruments. They also examine the NBC and communication equipment located on their reconnaissance vehicle. As they begin their reconnaissance, patrol members don their individual protective gear.

If only one route is to be covered, it is divided into 1 to 2 kilometer segments and reconnoitered by the patrols in leapfrog fashion. When performing NBC reconnaissance of multiple routes, one patrol is assigned to each route. If NBC reconnaissance is being conducted in support of a march, the patrol operates well in front of the main body. The patrol may operate as part of a forward security element or combat reconnaissance patrol, or it may move along a separate route. The patrol leader normally makes reports to the maneuver unit commander for every 2 or 3 kilometers of route his patrol reconnoiters.

As a patrol performs its mission, a designated crewman constantly observes the readings of the onboard NBC survey meters. If radioactive or chemical contamination is discovered, the patrol immediately determines the radiation level or type of toxic substance present. The patrol leader plots contaminated areas on his map, reports to his commander, and orders his patrol to mark the contaminated areas with warning flags that are dispensed mechanically from a device mounted on the rear of the reconnaissance vehicle. The patrol designates bypass routes around contaminated areas or finds routes through the area with the lowest levels of contamination.

In the event of nuclear contamination, bypass routes normally are sought when radioactivity encountered by a patrol measures above 30 roentgens per hour. Otherwise, routes normally are found through the contaminated area that have the lowest levels of contamination. When establishing bypass routes, a patrol returns to the assigned routes as soon as practicable.

On completion of its mission, an NBC reconnaissance patrol moves to its assigned assembly area, where final reports are made and patrol members are debriefed. Patrol members also decontaminate themselves, their individual NBC protective gear, and their vehicle and its equipment.

Decontamination Procedures

Soviet doctrine prescribes that in the event of contamination, a combat unit should conduct a partial decontamination with organic equipment and solutions no later than one hour after having been subjected to NBC contamination. This entails a brief halt while troops decontaminate themselves and their clothing, their individual weapons, crew-served weapons, and combat vehicles. If a unit is forced to conduct partial decontamination in the contaminated area, personnel remain in NBC protective gear while doing so. Following the completion of partial decontamination, the unit immediately resumes its mission. After a unit accomplishes its mission, but no later than 5 hours from the time of contamination, it should undergo complete decontamination of personnel, clothing, NBC protective gear, armament, and equipment.

Complete decontamination of a maneuver unit is performed by chemical defense troops. As with chemical reconnaissance elements, decontamination units of chemical defense companies and battalions can operate either as a whole or in smaller elements. Decontamination units deploy to areas where contaminated combat units are located. They set up near movement routes or establish centrally located decontamination points to serve several troop units.

Before deploying his equipment, the commander of a decontamination unit dispatches a reconnaissance group to select a favorable site, mark off areas with pegs for setting up the various pieces of equipment, and establish and mark routes of entry and exit for the site. Sites are selected that provide natural concealment, good approach routes, terrain protection, and sources of uncontaminated water. After decontamination stations are set up, the decontamination unit commander orders security measures against enemy observation or attack. This normally includes making use of natural concealment, employing camouflage, and digging tr
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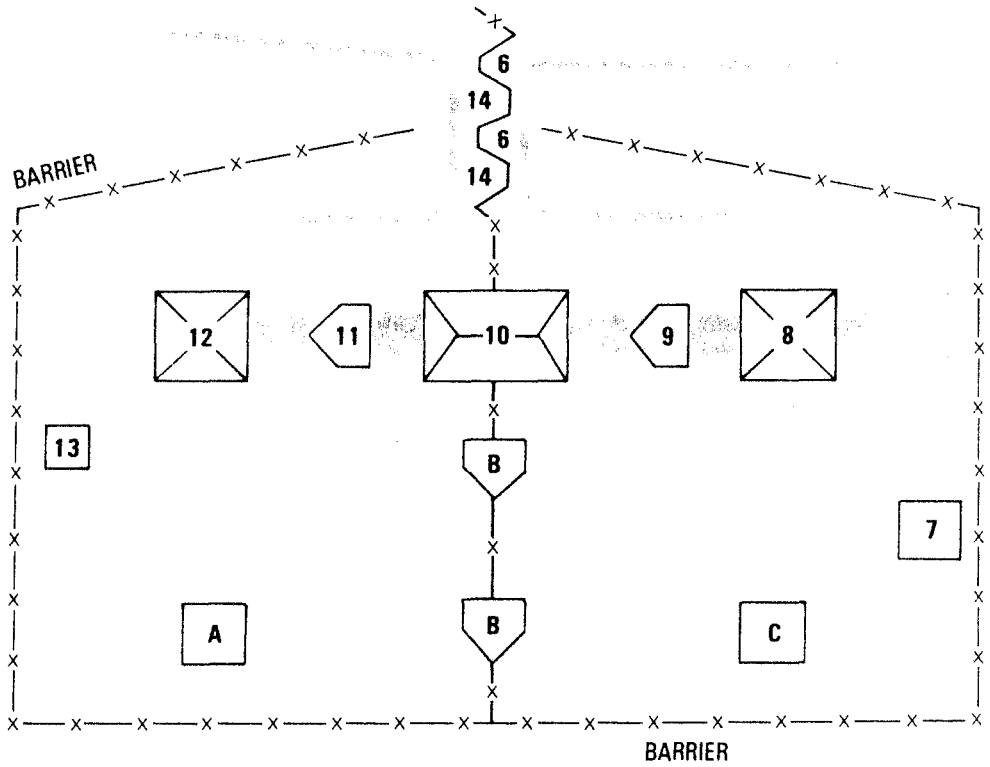
Movement of Personnel for Decontamination



STEPS

1. Initial reception of personnel for decontamination.
2. Decontamination of weapons and protective equipment.
3. Checking the decontamination of weapons and protective equipment.
4. Removal of protective clothing (except protective mask).
5. Treatment of outer clothing.
6. Stacking of individual weapons and protective equipment.
7. Treatment of protective mask and exposed parts of the body.

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Before deploying his equipment, the commander of a decontamination unit dispatches a reconnaissance group to select a favorable site, mark off areas with pegs for setting up the various pieces of equipment, and establish and mark routes of entry and exit for the site. Sites are selected that provide natural concealment, good approach routes, terrain protection, and sources of uncontaminated water. After decontamination stations are set up, the decontamination unit commander orders security measures against enemy observation or attack. This normally includes making use of natural concealment, employing camouflage, and digging trenches. If natural concealment is insufficient, a smokescreen may be generated. Luminous markers are emplaced to guide troops of contaminated units to the decontamination stations.

Crews remain in their vehicles while the vehicles are decontaminated. To decontaminate their vehicles, operators drive in columns past two TMS-65s, one located on each side of the road, operated by chemical defense troops. If TMS-65s are not available, ARS-12s or 14s may be used, although they are not as fast as the TMS-65s. After decontamination, each vehicle is checked for any remaining contamination.

Troops then proceed to the personnel decontamination stations, which are set up in tents. The major piece of equipment used to supply warm water for showers and to decontaminate clothing is the DDA-53 or DDA-66 steam chamber vehicle. (More information on decontamination equipment can be found in FM 100-2-3.)

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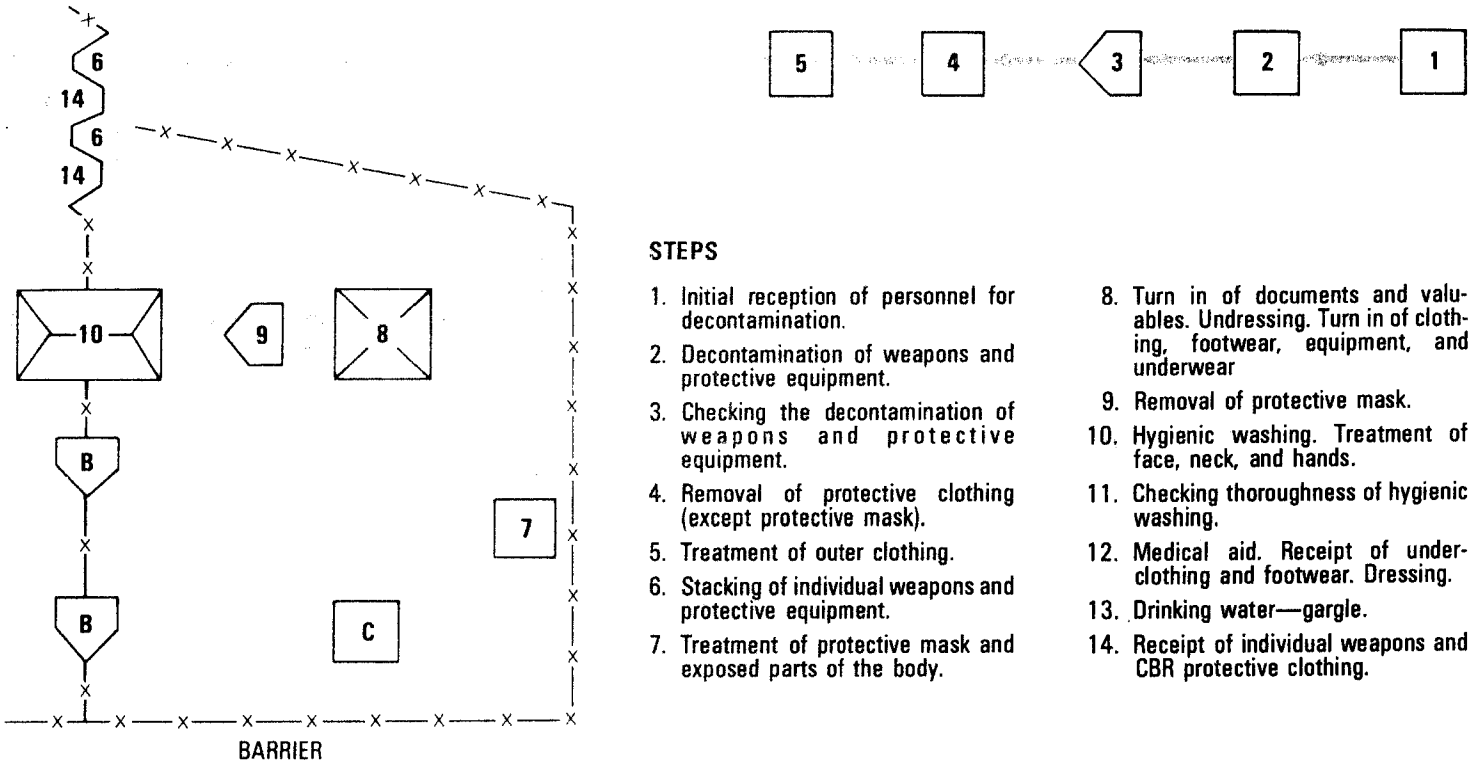

STEPS

1. Initial reception of personnel for decontamination.
2. Decontamination of weapons and protective equipment.
3. Checking the decontamination of weapons and protective equipment.
4. Removal of protective clothing (except protective mask).
5. Treatment of outer clothing.
6. Stacking of individual weapons and protective equipment.
7. Treatment of protective mask and exposed parts of the body.
8. Turn in of documents and valuables. Undressing. Turn in of clothing, footwear, equipment, and underwear
9. Removal of protective mask.
10. Hygienic washing. Treatment of face, neck, and hands.
11. Checking thoroughness of hygienic washing.
12. Medical aid. Receipt of underclothing and footwear. Dressing.
13. Drinking water—gargle.
14. Receipt of individual weapons and CBR protective clothing.

LEGEND
A Storage - clean. B DDA 53 C Storage - contaminated.

COMBAT IN AN NBC ENVIRONMENT

A maneuver unit commander receives much of his initial information regarding the NBC situation in combat orders issued by a higher unit. He supplements this information with intelligence acquired by his own reconnaissance assets. As he makes his estimate of the situation, he considers:

- Effects of the present NBC situation on organization of forces for combat; influence of possible enemy use of NBC weapons.
- Condition of NBC protective equipment, concealment and cover in the area of activity.
- Meteorological conditions that might influence the movement of contamination.

Based on his estimate, the commander issues instructions to his subordinates. These instructions include missions for attached and organic NBC reconnaissance elements, special measures to be taken while crossing contaminated terrain, the subunits responsible for conducting rescue work in the event of enemy NBC attack, and signals to be used for warning of the enemy NBC attack.

Two different sets of NBC warning signals normally are designated—one for nuclear attack or contaminated area encountered and one for chemical or biological agent situations. If an NBC warning signal is given on a march or during an attack, exposed troops must halt to don protective masks and protective suits and then continue their mission. NBC protective gear is removed only on the commander's order.

Once subjected to an NBC situation, the commander is required to make periodic reports regarding his unit's exposure to contamination. Reports include the amount of contamination received by platoons as a whole and by officers individually. If exceptionally high levels of contamination are experienced, reports are made immediately.

If a unit is subjected to an enemy NBC strike, the commander organizes reconnaissance of the area of destruction or contamination, restores communications, and orders predesignated subunits to begin rescue operations. In addition, he reports losses to his superior and appoints replacement commanders.

Actions During the March

Before conducting a march, the commander issues his march order, which designates those subunits assigned to conduct NBC reconnaissance, signals used to warn of NBC attack or contaminated areas, and recovery procedures following an NBC attack. The following is an example of a motorized rifle battalion commander's instructions regarding NBC aspects of a march.

Commander's Orders in an NBC Situation

During the march, a chemical reconnaissance squad will advance with the combat reconnaissance patrol. The chemical reconnaissance squad is responsible for marking contaminated areas and measuring intensity levels of contamination. Communications with the squad will be through the commander of the combat reconnaissance patrol. A chemical observation post will be established at the battalion command post, and chemical observers will be assigned to the companies.

The NBC warning signals are a red flare shot into the air and the word *Groza* transmitted over the radio.

On my order, antiradiation tablets* are to be taken by personnel.

Contaminated areas will be crossed at maximum speed and with troops in NBC protective gear. Distance between vehicles during transit will be 100 meters.

* Soviet antiradiation tablets are contained in individual medical kits. The Soviets have fielded a number different types of tablets, some of which are mildly effective or are of very little benefit. At most, tl tablets can only treat initial symptoms of radiation sickness, such as headaches, dizziness, and nause

The Offense

If a force occupies an assembly area before initiation of an attack, personnel and equipment are dispersed to ensure maximum protection against enemy use of NBC weapons. A distance of 50 meters is prescribed for vehicle intervals. Companies are separated by at least 1.5 kilometers. Commanders notify subordinates of NBC warning signals and the measures to be taken under NBC attack. Contingency plans are developed governing the restoration of control, reconstitution of combat units, and evacuation of personnel and equipment.

If an enemy force employs NBC weapons during any phase of the attack, Soviet forces are to take precautionary measures immediately. They don their protective gear, and continue their advance. They then perform a partial decontamination as soon as possible.

If a defending enemy force conducts a withdrawal, attacking units commence pursuit operations. Close contact during pursuit restricts a withdrawing enemy's use of NBC weapons since, in using them, he would endanger his own troops.

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Commander's Orders in an NBC Situation

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On my order, antiradiation tablets* are to be taken by personnel.

Contaminated areas will be crossed at maximum speed and with troops in NBC protective gear. Distance between vehicles during transit will be 100 meters.

By 2000 hours today, all units must verify the supply and condition of their NBC equipment, to include individual protective clothing, reconnaissance instruments, decontamination equipment, and vehicle collective systems.

Following transit of contaminated areas, partial decontamination will be performed on order of the company commanders at the first halt.

If the enemy attacks our columns with NBC weapons, wounded personnel will be evacuated to the battalion medical point.

Destroyed vehicles and equipment should be moved to the side of the road. My deputy commander is in overall charge of all recovery operations following an NBC strike.

Prior to initiation of the march, a review is to be conducted with battalion personnel regarding actions on contaminated terrain and the conduct of partial decontamination.

* Soviet antiradiation tablets are contained in individual medical kits. The Soviets have fielded a number of different types of tablets, some of which are mildly effective or are of very little benefit. At most, the tablets can only treat initial symptoms of radiation sickness, such as headaches, dizziness, and nausea.

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If a defending enemy force conducts a withdrawal, attacking units commence pursuit operations. Close contact during pursuit restricts a withdrawing enemy's use of NBC weapons since, in using them, he would endanger his own troops.

Following an attack, subunits assemble as soon as possible for complete decontamination performed by chemical defense troops.

The Defense

Before occupying defensive positions, chemical reconnaissance squads survey the area and mark any contaminated sectors. Chemical observers are assigned to company and battalion command posts and to artillery firing positions. To attain reliable NBC protection, chemical observation posts of two or three observers are established throughout a defensive position at a ratio of one post for each 2 to 2.5 kilometers of defensive area. During bad weather, more chemical observation posts normally are set up. Observers periodically switch on their NBC detection instruments and make reports as prescribed in the commander's combat order.

If a defending force is subjected to a NBC attack, chemical reconnaissance squads determine the type

and intensity of contamination and mark contaminated sectors. Partial decontamination and first aid are performed, and defensive structure is reestablished.

Before a withdrawal, chemical reconnaissance patrols reconnoiter withdrawal routes, mark contaminated sectors, and establish bypass routes. Withdrawing main body forces travel over multiple routes and in dispersed formation for protection against enemy NBC attacks.

Recovery Operations

Commanders at all levels plan recovery operations to be undertaken in the event of NBC attacks. Recovery operations entail restoring control, reconnoitering the area of destruction, conducting rescue work to include repair of vehicles and evacuation of wounded, extinguishing fires, performing decontamination of personnel and equipment, and forming new combat units from surviving ones and reinforcements.

Depending on the situation and availability of forces, recovery detachments are either formed from organic subunits or made available by higher headquarters. If formed from organic units, they normally come from the second echelon or reserve of a combat force. Regardless of origin, recovery detachments are established and receive a general mission before the conduct of an operation. The detachments usually include chemical reconnaissance, motorized rifle, engineer, medical, and vehicle repair personnel.

Following an NBC attack, the unit commander orders the implementation of recovery measures and gives the priority of their implementation. Chemical reconnaissance patrols are normally the first to reach the area of destruction. They determine the nature and intensity of contamination and mark contaminated

Actions Performed During Recovery Operations

IN THE EVENT OF ENEMY NUCLEAR ATTACK	
AREA RECONNAISSANCE:	Determination of approach routes to locations of affected units; measurement of radiation levels. Determining degrees of destruction, presence of fires, and losses in manpower and equipment. Selection of evacuation routes and points for gathering sick and wounded and damaged equipment.
RESCUE WORK:	Determination of amount and sequence of rescue work. Finding wounded and sick and getting them out of damaged equipment and combat vehicles.
PERSONNEL AND EQUIPMENT EVACUATION:	Rendering first aid to wounded and sick. Removing them to collection points and evacuating them to the medical post. Evacuation of damaged equipment from the area.
DECONTAMINATION:	Decontamination of personnel, weapons, and equipment.
IN THE EVENT OF ENEMY CHEMICAL ATTACK	
CHEMICAL RECONNAISSANCE:	Determination of type of toxic agent used by enemy and designation of boundaries of contaminated area. Selection of evacuation routes and areas for deployment of medical post and decontamination station.
RESCUE WORK:	Finding the injured, getting them out of combat vehicles and engineering equipment. Putting protective masks on wounded, administering first aid and chemical agent antidotes.
PERSONNEL AND EQUIPMENT EVACUATION:	Removal of wounded to medical post. Administration of antidotes as necessary. Preparing wounded personnel and unmanned equipment for evacuation.
DECONTAMINATION:	Decontamination of personnel and degasification of equipment and weapons.

sectors. The recovery detachment commander appoints new unit commanders to replace casualties. He selects locations for setting up a medical aid station, NBC contamination station, damaged-vehicle collection point, and an area for reconstituting units. He also designates routes for reinforcement and evacuation to and from the area. He then reports to his next higher commander on the situation and the measures taken. Meanwhile, engineers assigned to the damage control detachment clear rubble, extinguish fires, rescue personnel, and build temporary roads. Personnel and vehicles that are fit to return to duty are decontaminated first. The final step consists of forming new units and equipping them with weapons and combat vehicles. While the recovery detachment performs its mission, elements from a combat unit's second echelon or reserve that were not affected by the enemy NBC attack provide security by screening against any further enemy activity.

CONCLUSIONS

The Soviet Army is the best prepared force in the world to conduct both offensive and defensive NBC operations. Numbering 80,000 to 100,000 personnel, chemical defense troops are capable of accomplishing a number of tasks in support of combat troops. They have a wide variety of dependable equipment which, for the most part, is in good supply. Individual items of equipment are adequate to protect from contamination for hours, days, or longer, depending on the nature and concentration of the contaminant. Antidotes provide protection from the effects of Soviet agents as well as those of Western countries. Agent detector kits and automatic alarms are available in adequate quantities and are capable of detecting all standard, agents. Timely detection and warning of an attack, however, remain a problem.

Besides providing their troops with dependable protective equipment, the Soviets place heavy emphasis on individual NBC protective training which attempts to psychologically temper personnel to the demands of NBC warfare. Soviet troops are subjected to realistic and stressful situations while learning the technical skills needed to operate in NBC environments. Up-to-date instructional materials are widely available. Training is generally comprehensive and realistic. Individual protection, reconnaissance, and decontamination are all stressed.

GLOSSARY

ACRONYMS AND ABBREVIATIONS

AAA .....antiaircraft artillery
AAG .....army artillery group
AAICV .....airborne amphibious infantry combat vehicle
ACRV .....artillery command and reconnaissance vehicle
ACV .....armored command vehicle
AGI .....auxiliary intelligence gatherers
AICV .....amphibious infantry combat vehicle
AMRP .....artillery mobile reconnaissance post
An-(no.) .....Soviet designation for aircraft from Antonov design bureau
APC-T .....armor piercing capped tracer round
API-T .....armor piercing incendiary tracer round
AP-T .....armor piercing tracer round
APVO .....Aviation of National Air Defense
AS-(no.) .....US designation for Soviet air-to-surface missile
ASC .....armored scout car
ASM .....air-to-surface missile
ASW .....antisubmarine warfare
AT-(no.) .....US designation for Soviet antitank guided missile
ATGM .....antitank guided missile
BAF .....battalion assault force (naval infantry)
BVR .....beyond-visual-range
CBU .....cluster bomb unit
CES .....chief of engineer services
CINC .....commander-in-chief
COMINT .....communications intelligence (US term)
COP .....command observation post
CRP .....combat reconnaissance patrol
CRTA .....chief of rocket troops and artillery
DAG .....division artillery group
DF .....direction finding
DOI .....date of introduction
DOSAAF .....Voluntary Society of Assistance to the Army, Aviation, and Navy (premilitary training organization)
DZ .....drop zone
ECM .....electronic countermeasures
ELINT .....electronic intelligence (US term)
EMP .....electromagnetic pulse
ESM .....electronic warfare support measures (US term)
FAC .....forward air controller
FEBA .....forward edge of the battle area (US acronym used in this manual as the equivalent of the Soviet term "forward edge")
FOP .....forward observation post
Frag-HE .....fragmentation high-explosive round
FROG .....free rocket over ground
FS .....fin-stabilized round
FSE .....forward security element (of the Advance Guard)
GAZ-(no.) .....medium truck produced by Gorkiy Motor Vehicle Plant
GRU .....general staff's main intelligence directorate
HE .....high-explosive round
HEAT .....high-explosive antitank round
HEI .....high-explosive incendiary round
HEP .....high-explosive plastic round
HVAP .....hyper-velocity armor piercing round
HVAPFSDS ..hyper-velocity armor piercing fin-stabilized discarding Sabot round
IFV .....infantry fighting vehicle
Il-(no.) .....Soviet designation for aircraft from Ilyushin design bureau
INA .....information not available at the UNCLASSIFIED level
IR .....infrared
IRBM .....intermediate-range ballistic missile
I-T .....incendiary tracer round
KamAZ-(no.) .medium truck produced by Kama River Motor Vehicle Plant
KGB .....Committee for State Security
KrAZ-(no.) ....heavy truck produced by Kremenchug Motor Vehicle Plant
LMG .....light machinegun
LOC .....line of communications
LOP .....lateral observation post
LRA .....long range aviation
LuAZ-(no.) ....light truck produced by Lutsk Motor Vehicle Plant
LZ .....landing zone

MAZ-(no.) ....heavy truck produced by Minsk Motor Vehicle Plant
MCLOS .....manual-command-to-line-of-sight guidance
Mi-(no.) .....Soviet designation for helicopter from Mil design bureau
MiG-(no.).....Soviet designation for aircraft from Mikoyan-Gurevich design bureau
MOD.....Ministry of Defense; Minister of Defense
MOD.....Mobile Obstacle Detachment (Engineer Element)
MOP .....mobile observation post
MPA .....Main Political Directorate
MRBM .....medium-range ballistic missile
MRD.....motorized rifle division
MRL .....multiple rocket launcher
MRR .....motorized rifle regiment
MSD.....movement support detachment (engineer element)
MVD.....Ministry of Internal Affairs
OMG.....operational maneuver group
POL.....petroleum, oils, lubricants
PPO.....primary party organization
PGM .....precision-guided munitions
PVO.....air defense
PWP .....plasticized white phosphorus
RAG .....regimental artillery group
RAP.....rocket-assisted projectile
RDF.....radio direction finding
REC.....radioelectronic combat
REG .....repair and evacuation group
rkh .....Russian abbreviation (literally: radio-chemical) used as suffix in Soviet designations for NBC reconnaissance vehicles
RVGK.....Reserve of the Supreme High Command
SA-(no.).....US designation for Soviet surface-to-air missile
SACLOS .....semiautomatic-command-to-line-of-sight guidance
SAM .....surface-to-air missile
shp.....Shaft horsepower
SLAR .....side-looking airborne radar
SP .....self-propelled
SPAAG .....self-propelled antiaircraft gun
SRBM.....short-range ballistic missile
SRF.....strategic rocket forces
SS .....spin-stabilized round
SS-(no.) .....US designation for Soviet surface-to-surface missile
SSM .....surface-to-surface missile
STOL.....short takeoff and landing aircraft
Su-(no.) .....Soviet designation for aircraft from Sukhoi design bureau
TASM.....tactical air-to-surface missile
TD .....tank division
TEL .....transporter-erector-launcher
TELAR .....transporter-erector-launcher-and-Radar
TOP.....technical observation point
TR .....tank regiment
Tu-(no.) .....Soviet designation for aircraft from Tupolev design bureau
TVD.....theater of military operations
UAZ-(no.).....light truck produced by Ulyanovsk Motor Vehicle Plant
Ural-(no.).....medium truck produced by Ural Motor Vehicle Plant (not an acronym)
UW .....unconventional warfare
VOSO.....Central Military Transportation Directorate
VTA.....military transport aviation
VTOL.....vertical takeoff and landing
VVS.....Soviet Air Force
WP.....white phosphorus
Yak-(no.) .....Soviet designation for aircraft from Yakovlev design bureau
ZIL-(no.).....medium truck from Likhachev Motor Vehicle Plant

NATO NICKNAMES

Air-To-Surface Missiles

KANGAROO, AS-3
KELT, AS-5
KERRY, AS-7
KINGFISH, AS-6
KIPPER, AS-2
KITCHEN, AS-4

Aircraft

BACKFIRE, Tu-26
BADGER, Tu-16
BEAR, Tu-95
BLACKJACK, Tu-?
BLINDER, Tu-22
BREWER, Yak-28
CAMBER, Il-86
CANDID, Il-76
CLINE, An-32
COALER, An-72
COCK, An-22
COOT, Il-18
CUB, An-12
CURL, An-26
FARMER, MiG-19
FENCER, Su-24
FIREBAR B, Yak-28P
FISHBED, MiG-21
FITTER A, Su-7B
FITTER C, Su-17
FLANKER, Su-27
FLOGGER B, MiG-23
FLOGGER D, MiG-27
FOXBAT, MiG-25
FOXHOUND, MiG-31
FRESCO, MiG-17
FULCRUM, MiG-29

Antitank Guided Missiles

SAGGER, AT-3
SPANDREL, AT-5
SPIGOT, AT-4
SPIRAL, AT-6
SWATTER, AT-2

Helicopters

HALO A, MI-26
HARE, MI-1
HARKE, MI-10, MI-10K
HIND, MI-24
HIP, MI-8
HOMER, MI-12
HOOK, MI-6
HOPLITE, MI-2
HOUND, MI-4

Radars

BIG FRED, MT-SON
END TRAY, RMS-1
FIRE CAN, SON-9,SON-9A
FLAP WHEEL
FLAT FACE, P-15
GUN DISH
LONG TROUGH
PORK TROUGH
PORK TROUGH 2, SNAR-6
SMALL FRED, BMP-SON
SMALL YAWN

Surface-To-Air Missiles

GAINFUL, SA-6
GAMMON, SA-5
GANEF, SA-4
GASKIN, SA-9
GECKO, SA-8
GOA, SA-3
GRAIL, SA-7
GUIDELINE, SA-2

Surface-To-Surface Missiles

SCALEBOARD, SS-12
SCUD A, SS-1b
SCUD B, SS-1c

FM 100-2-1

16 JULY 1984

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

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